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Cardiovascular Imaging In-a-Month

•A 67-Year-Old Man With Progressive Shortness of Breath

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CASE

A 67-year-old man was admitted because of rapidly progressing shortness of breath during the previous week. His blood pressure was 128/80 mmHg. Physical examination showed jugular vein dilatation and bilateral pretibial edema. Chest radiography showed cardiomegaly and bilateral pleural effusion. Electrocardiography showed sinus tachycardia (108/min) and low voltage in the limb leads. Echocardiography was performed (**Fig. 1**).

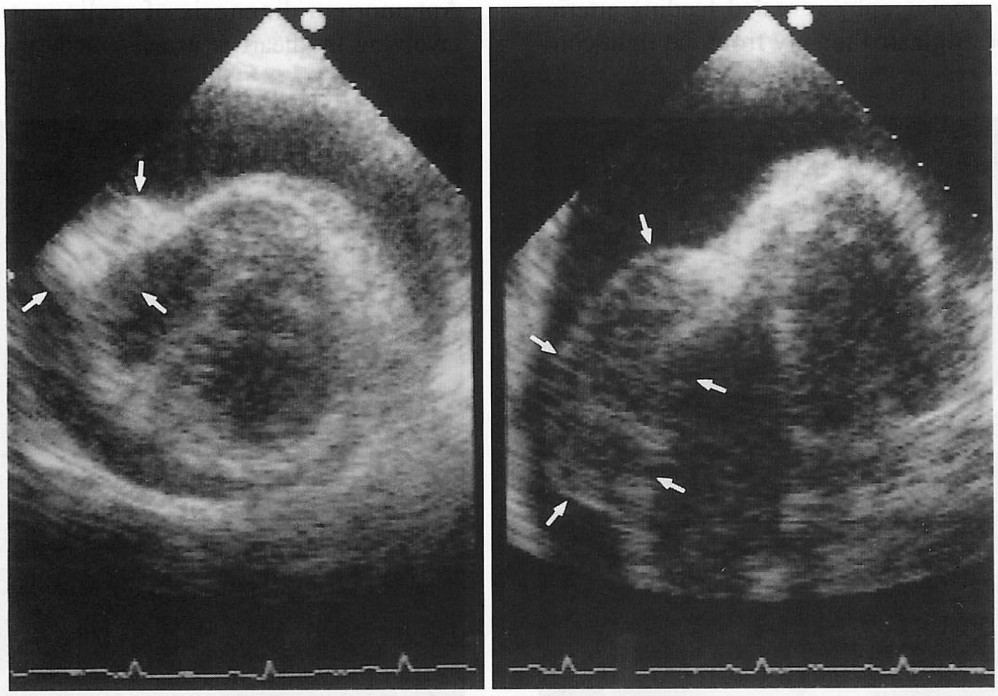

Fig. 1

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Points for Diagnosis

Echocardiography revealed a tumor at the anterior side of the right atrium and the right ventricle with massive pericardial effusion (**Fig. 1**). Chest computed tomography (CT) after intravenous contrast administration revealed an enhanced tumor in the superior anterior mediastinum as well as in the heart (**Fig. 2**). Abdominal CT showed no evidence of hepatosplenomegaly or lymph node swelling. Pericardiocentesis was performed immediately, draining 620 m*l* of bloody fluid. After removal of 1,200 m*l* of fluid, his general condition improved rapidly. Cytological examination of the pericardial effusion indicated malignant lymphoma. Although the site and extension of the cardiac tumor was not determined through echocardiography and CT, magnetic resonance imaging (MRI) after pericardiocentasis clearly visualized the tumor filling the pericardial space anteriorly and partially involving the right ventricular chamber (**Fig. 3**).

Coronary angiography revealed feeding arteries to the tumor originated mainly from the right coronary artery similar to coronary neovascularization (**Fig. 4**). Endomyocardial biopsy from the right ventricle confirmed the diagnosis of diffuse large cell type malignant lymphoma (**Fig. 5**). Immunohistochemical studies showed the tumor cells were the B-lymphocytic phenotype. After chemotherapy, both tumors significantly reduced in size (**Fig. 6**), and he became asymptomatic and is going to receive second chemotherapy with pirarubicin hydrochloride, cyclophosphamide, vincristin and prednisolone.

The heart is involved by malignant lymphoma with an incidence of 8.7% to 24% at autopsy[1,2]. However, origin of malignant lymphoma in the heart is extremely rare[3]. The cardiac tumor in the present case could not be confirmed as "primary", because there was another tumor in the mediastinum. However, no other swollen lymph nodes were seen in systemic scanning by CT. Antemortem diagnosis of malignant lymphoma involving the heart is usually made by cytological

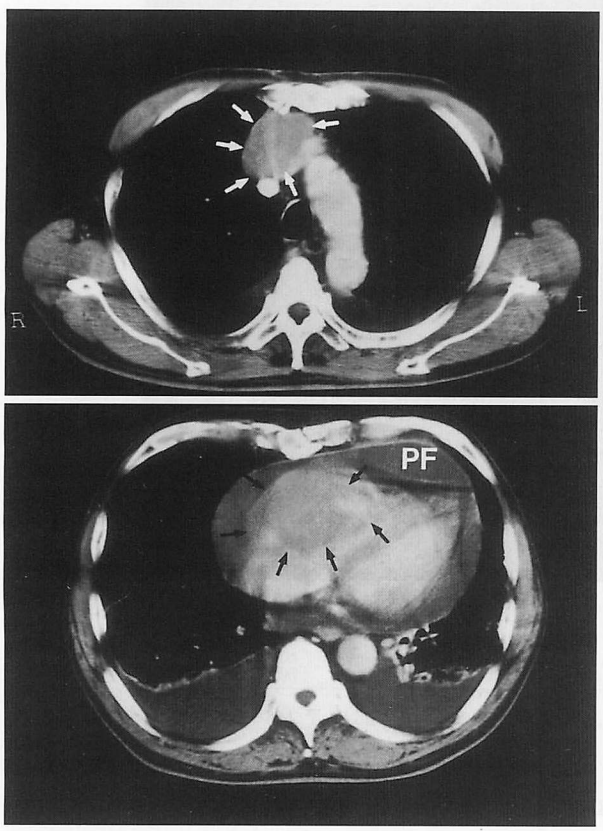

Fig. 2

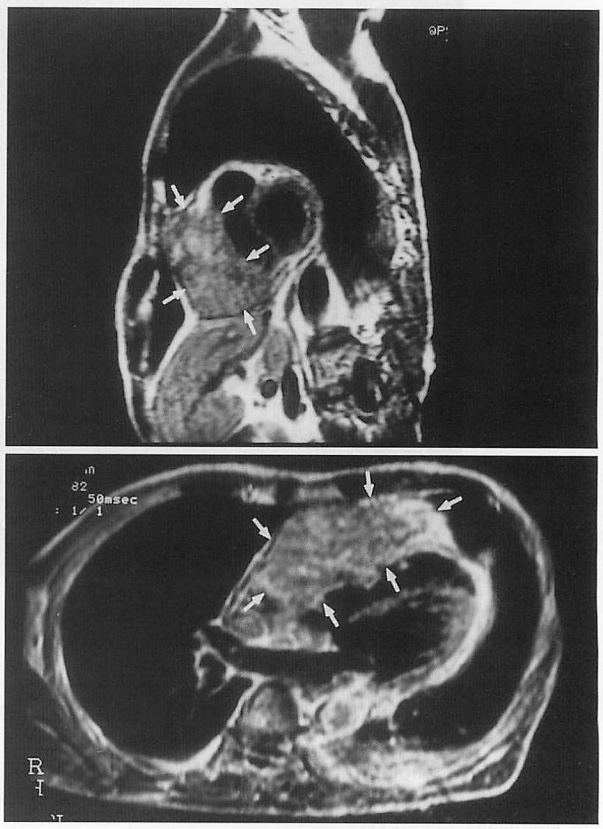

Fig. 3

examination of pericardial fluid[4], so this case of antemortem diagnosis of cardiac lymphoma by endomyocardial biopsy is very unusual.

Diagnosis: Diffuse large B-cell type of non-Hodgkin's lymphoma

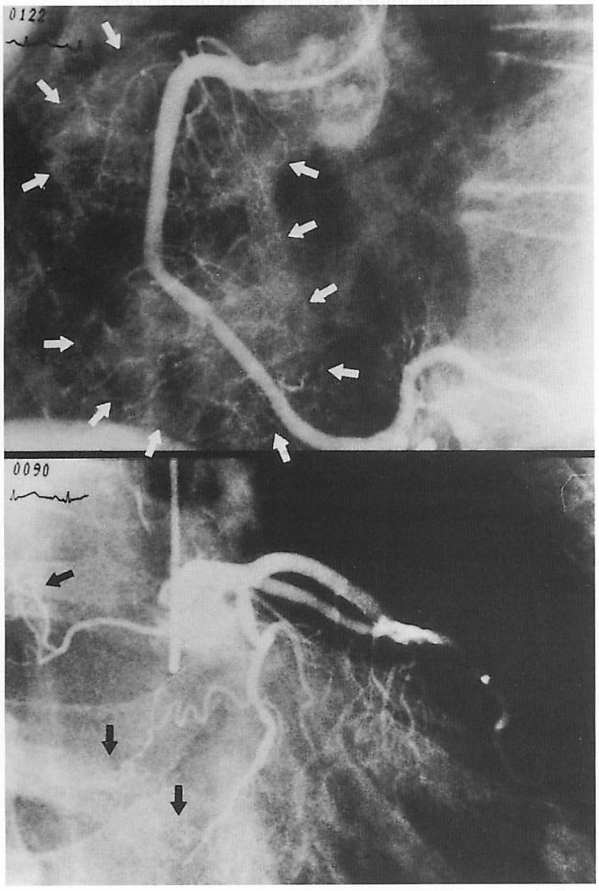

Fig. 4

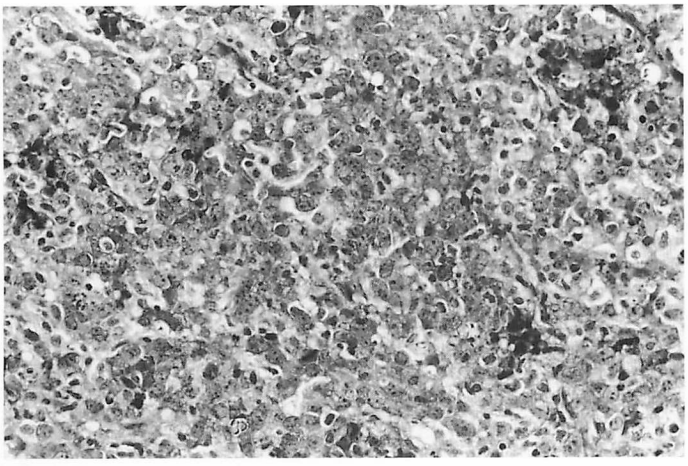

Fig. 5

Acknowledgments

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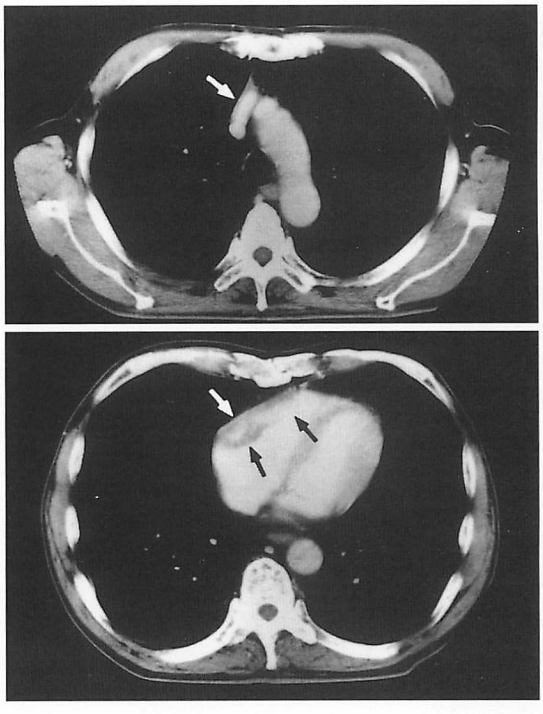

Fig. 6

Fig. 1 Two-dimensional echocardiograms on admission
A tumor (*arrows*) at the anterior side of the right atrium and ventricle with massive pericardial effusion are observed in the parasternal short-axis view (*left*) as well as in the apical four-chamber view (*right*).

Fig. 2 Contrast-enhanced CT scans of the chest showing enhanced tumors (*arrows*) in the superior-anterior mediastinum (*upper*) and the right heart (*lower*)
PF = pericardial fluid.

Fig. 3 MRI after pericardiocentesis clearly showing the extent of the right-side involvement by the tumor (*arrows*) with marked reduction of pericardial fluid

Fig. 4 Coronary angiograms showing the feeding arteries from the right (*upper*) and left (*lower*) coronary arteries to the tumor (*arrows*)

Fig. 5 Photomicrograph of cardiac lymphoma showing diffuse large cell type of malignant lymphoma (hematoxylin-eosin stain, × 400)

Fig. 6 Contrast-enhanced CT scans of the chest after chemotherapy showing a reduction in the size of the tumors (*arrows*) in the superior-anterior mediastinum (*upper*) and the right heart (*lower*)
These are the same levels as in Fig. 2.